Volatile Sulfur Compounds (VSCs) quantification by Head-Space Solid Phase Microextraction Gas Chromatography Tandem Mass Spectrometry (HS-SPME-GC-MS/MS) in wines.

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Volatile sulfur containing compounds (VSCs) are present in products such as cheese, beer or wine playing an important role in the field of food science. VSCs have very powerfull aroma due to their very low odor detection thresholds. In wine high levels of VSCs are considered as off-flavours, conferring wine unpleasant odors of rotten egg, onion, garlic and tire. However at low concentration some VSCs can participate to wine aroma. VSCs are produced at different stages of winemaking and storage in multiple way. To monitoring the phenomenon an HS-SPME-GC-MS/MS method was developed. The proposed method permitted to quantify 36 compounds. The number of VSCs analyzed in a single run was higher than with other methods (sulfur chemiluminescence and flame photometry). In the literature, only one MS method has been reported, using a single quadrupole in SIM mode. In the proposed method, a triple-quadrupole in MRM mode was used reducing considerably the signal/noise ratio, and selectivity was considerably augmented by choosing appropriate transitions. The greater specificity made possible to resolve many co-eluted peaks, giving shorter chromatographic runs and saving time in routine analysis. SPME extraction was performed using a carboxen-polydimethylsiloxane (CAR-PDMS) fiber, that proved to be the most effective fiber coating. Extraction conditions like time and temperature have been optimized as well as MS/MS parameters (transition and collision energy). The overall process was successfully applied to identify and quantify sulphur compounds in both white and red wines.

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